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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,883	02/15/2007	Nicolas Drolet	19226-US-NP	9927
23553	7590	07/23/2010		
MARKS & CLERK P.O. BOX 957 STATION B OTTAWA, ON K1P 5S7 CANADA			EXAMINER SUCH, MATTHEW W	
			ART UNIT 2891	PAPER NUMBER
			MAIL DATE 07/23/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/573,883

Applicant(s)

DROLET ET AL.

Examiner

MATTHEW W. SUCH

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2010.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-16 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 5-16 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 9 is objected to because of the following informalities: the phrase "said 2,7-carbazolenevinylene" in Line 2 should read "said conjugated 2,7-carbazolenevinylene".

Appropriate correction is required.

2. Claim 12 is objected to because of the following informalities: the phrase "material a conjugated" in Line 4 should read "material the conjugated". Appropriate correction is required.

3. Claim 16 is objected to because of the following informalities: the phrase "polymeric material according" in Line 3 should read "polymeric conjugated 2,7-carbazolenevinylene derivative" and the phrase "Z is derived from a comonomer" in Line 9 should read "Z is a comonomer". Appropriate correction is required.

Claim Rejections - 35 USC § 112

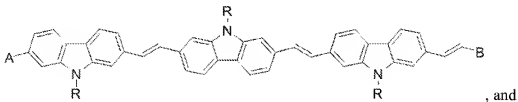
4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

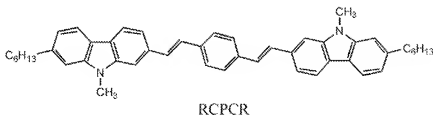
5. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 5 recites that the 2,7-carbazolenevinylene derivative is RCPCR. However, the

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compound of RCPCR does not fit the definition of the 2,7-carbazolevinylene derivative set forth in claim 16. Specifically, the formula for the 2,7-carbazolevinylene derivative set forth in claim 16 requires at least two features that are not included in the compound of RCPCR. Those features are: (1) that n is equal to or greater than 3, and so any compound fitting this formula would require 3 or more of the 2,7-carbazolevinylene monomeric groups, for example, as shown in the closest configuration possible with the language of claim 16 (wherein $n=3$, $x=1$, $y=0$, $A=B=C_6H_{13}$ and $R=C_6H_{13}$):



(2) the 2,7-carbazolevinylene as claimed in the formula requires that a vinylene-B group be present and one end and a carbazole-A group be present at the other. The compound of RCPCR does not meet either of these criteria as shown:

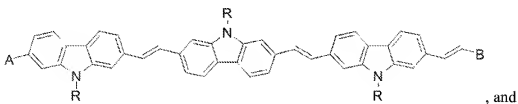


which fails to include 3 or more 2,7-carbazole groups and fails to terminate with a vinylene-B group as required.

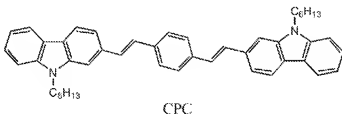
6. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 recites that the 2,7-carbazolevinylene derivative is CPC. However, the

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compound of CPC does not fit the definition of the 2,7-carbazolevinylene derivative set forth in claim 16. Specifically, the formula for the 2,7-carbazolevinylene derivative set forth in claim 16 requires at least two features that are not included in the compound of CPC. Those features are: (1) that n is equal to or greater than 3, and so any compound fitting this formula would require 3 or more of the 2,7-carbazolevinylene monomeric groups, for example, as shown in the closest configuration possible with the language of claim 16 (wherein $n=3$, $x=1$, $y=0$, $A=B=\text{Hydrogen}$ and $R=\text{C}_6\text{H}_{13}$):



(2) the 2,7-carbazolevinylene as claimed in the formula requires that a vinylene-B group be present and one end and a carbazole-A group be present at the other. The compound of CPC does not meet either of these criteria as shown:



which fails to include 3 or more 2,7-carbazole groups and fails to terminate with a vinylene-B group as required.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 5-8 and 13-16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 44, 95, 105, 120, 134 and 138-139 of copending Application No. 10/568,303. Although the conflicting claims are not

identical, they are not patentably distinct from each other because of the following reasons. The examiner provides to Leclerc US 2007/0069197 A1 (hereinafter Leclerc) for convenience.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

a. Regarding claim 16, claim 105 of Leclerc teaches a conjugated 2,7-carbazolenevinylene derivative polymer meeting the claimed formula with $x=1$, $y=0$, $n=5-100$, $A=B=\text{Hydrogen}$ and $R=\text{C}_8$ alkyl. The Examiner notes that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See, e.g., *In re Pearson*, 181 USPQ 641 (CCPA); *In re Minks*, 169 USPQ 120 (Bd Appeals); *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). See MPEP §2114. The recitation of "which is an Organic Field Effect Transistor (OFET) or an Organic Photovoltaic Cell (OPC)" does not distinguish the present invention over the claims of Leclerc who discloses the structure as claimed. Additionally, these uses are even claimed in claims 138 and 139, respectively. This further applies to claims 14 and 15.

b. In so far as claim 5 is definite, claim 95 of Leclerc discloses RCPCR.

- c. In so far as claim 6 is definite, claim 95 of Leclerc discloses RCPCR and while explicitly disclosing CPC, It would have been obvious to one of ordinary skill in the art at the time the invention was made to form CPC because claim 44 teaches that the starting compounds of Formula I can have hydrogen in either of R^2 or R^3 instead of the C_6H_{13} to make RCPCR, which yields the compound of CPC.
- d. Regarding claim 7, claim 120 of Leclerc discloses PCVDPATA.
- e. Regarding claim 8, claim 134 of Leclerc discloses PPCVT.
- f. Regarding claim 13, claim 105 of Leclerc discloses $y=0$ for all blocks.
9. Claims 9 and 10 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 105 and 139 of copending Application No. 10/568,303 in view of Dutta (Langmuir, Vol. 15). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons. The examiner provides to Leclerc US 2007/0069197 A1 (hereinafter Leclerc) for convenience.
- This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.
- Claim 105 of Leclerc teaches a conjugated 2,7-carbazolenevinylene derivative polymer meeting the claimed formula with $x=1$, $y=0$, $n=5-100$, $A=B=$ Hydrogen and $R=C_8$ alkyl and claim 139 sets forth a solar cell usage of this material layer. However, there is no disclosure of the

specific details which make up a solar cell device, such as a mixed layer forming a pn junction to be included with the conjugated 2,7-carbazolenevinylene derivative set forth.

However, Dutta teaches the conventional OPC device comprising a mixed layer forming a pn junction and suggest the compound of PTD as a suitable material for such purposes, given that this material is a perylene derivative and (see Page 607, Right Col., Lines 1-6 and Page 608, Left Col., Lines 15-25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the 2,7-carbazolenevinylene derivative active layer of Leclerc to be mixed with PTD as set forth by Tang in order to form a pn junction necessary for a solar cell.

10. Claims 9 and 11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 105 and 138 of copending Application No. 10/568,303 in view of Geens ('397). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons. The examiner provides to Leclerc US 2007/0069197 A1 (hereinafter Leclerc) for convenience.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim 105 of Leclerc teaches a conjugated 2,7-carbazolenevinylene derivative polymer meeting the claimed formula with $x=1$, $y=0$, $n=5-100$, $A=B=\text{Hydrogen}$ and $R=\text{C}_8$ alkyl and claim 138 sets forth a thin film transistor usage of this material layer. However, there is no disclosure of the specific details which make up a thin film transistor device, such as a mixture between a polymer and charge transfer material, such as PCBM, to be included with the conjugated 2,7-carbazolenevinylene derivative set forth.

However, Geens teaches thin film transistor device, such as a mixture between a polymer and charge transfer material, such as PCBM (see Figs. 2-4 and associated text). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the 2,7-carbazolenevinylene derivative transistor active layer of Leclerc with the PCBM charge transport material of Geens in order to yield ambipolar behavior (see Geens Para. 0015).

11. Claims 9 and 12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 105 and 139 of copending Application No. 10/568,303 in view of Tang ('431). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons. The examiner provides to Leclerc US 2007/0069197 A1 (hereinafter Leclerc) for convenience.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim 105 of Leclerc teaches a conjugated 2,7-carbazolenevinylene derivative polymer meeting the claimed formula with $x=1$, $y=0$, $n=5-100$, $A=B=$ Hydrogen and $R=C_8$ alkyl and claim 139 sets forth a solar cell usage of this material layer. However, there is no disclosure of the specific details which make up a solar cell device, such as an electron or hole transporting layer to be included with the conjugated 2,7-carbazolenevinylene derivative set forth.

However, Tang teaches the conventional OPC device comprising a hole transport layer (Element 18 with p-type electron donor compounds; Col. 12, Line 16) and an electron transport layer (Element 20 with n-type electron acceptor compounds; Col. 12, Line 18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the

2,7-carbazolenevinylene derivative active layer of Leclerc with the hole transport layer and/or electron transport layer as set forth by Tang. One would have been motivated to do so in order to form a rectifying p-n junction to convert light into electrical charges (see Col. 4, Lines 56-68).

Response to Amendment

12. The Declarations under 37 CFR 1.132 filed 7 June 2010 are sufficient to overcome the rejection of claims 4-5, 7-17 and 13-15 under 35 U.S.C. 102(e) based upon Leclerc ('197) and the rejection of claims 4 and 9-15 under 35 U.S.C. 102(e) based upon Leclerc ('172).

Response to Arguments

13. Applicant's arguments with respect to claims 4-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Zotti (Macromolecules, Vol. 35) teaches polycarbazole-based conjugated polymers and uses thereof.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW W. SUCH whose telephone number is (571)272-8895. The examiner can normally be reached on Monday - Friday 9AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kiesha Bryant can be reached on (571) 272-1844. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew W. Such/
Primary Examiner, Art Unit 2891